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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention relates to the release agent which used papers, such as cast paper, art paper, coat paper and fine coated paper, and paper of fine quality, or a polyester resin film as the base material.

It is especially related with the release agent for mold attachment manufacture also in it.

[0002]

[Description of the Prior Art] The release agent for mold attachment on base materials, such as paper of fine quality and coated paper, a polypropylene regin, The releasing layer which consists of silicone series resin and alkyd system resin is provided, and it is used as a release agent which casts a urethane paste, VCM/PVC sol, etc. in the manufacturing process of synthetic leather, a carbon fiber prepreg, flooring, a marking film, etc.

[0003] Although the role of the release agent used for synthetic leather manufacture is mold release of the resin coating held and dried until resin solutions, such as a urethane paste, dried, in casting, since the shape of surface type of a release agent is transferred, it serves also as the duty of mold attachment. Since repeated use of the barrier nature which does not infiltrate a resin solution into a base material, the mold-release characteristic from which after desiccation can remove resin coating easily, the heat resistance at the time of desiccation, and the release agent is carried out as the characteristic required for a release agent in many cases, They are the pliability for the ability not to break a support surface at the time of moderate tensile strength, tearing strength, curl balance, and mold attachment (embossing), scratch-proof nature, etc.

[0004] When manufacturing transfer objects, such as synthetic leather which has flat surface nature (enamel, a mat, etc.), Although what is necessary is to use coated paper and cast

paper for a base material, and just to process an it top with detachability resin, when manufacturing a transfer object with mold attachment, It is the purpose of defending a crack of the type of base material especially by the reproducibility of minute sections or sharp unevenness, and, usually the laminate layer which mainly uses polypropylene resin as the main ingredients is provided in a support surface. The laminate layer by such polypropylene is useful in the meaning of coverage reduction of the uniformly coating nature or a remover, even when it itself not only has a certain amount of detachability, but provides stratum disjunctum like silicone resin on it. For example, since the drying temperature is usually lower than the melting point of polypropylene when the resin which constitutes synthetic leather is a urethane paste, the lamination of polypropylene is used abundantly. In this case, a remover like silicone resin may be mixed and used for the polypropylene to laminate.

[0005]

[Problem(s) to be Solved by the Invention]When creating the release agent of such mold attachment, the lamination substrate which used polypropylene, The problem that the mold collapses when carrying out repeated use of the release agent although there is heat resistance for a urethane paste, The problem that swelling and the mold collapse by the humidity of paper cause mold collapse of the lamination substrate itself when paper is used for a base material, Since the adhesive lowness of the polypropylene-layers desorption for which it comes from the adhesive lowness to the paper of polypropylene, etc., or this polypropylene was covered, there was a problem of a heat-resistant fall, aggravation of mold holdout, etc. by mixing low density polyethylene etc. In the case where embossing is performed to the polypropylene lamination substrate which used paper as the base material, In order that unevenness might attain to the whole substrate, i.e., the rear face of paper, when rolling up was used, it could not roll round firmly but wound, and the path became large and the problem of being difficult also had the tension control holding a mold. Therefore, there is a problem which this invention tends to solve in providing the release agent for mold attachment which shape collapse does not carry out even if the reproducibility of mold attachment is good, elevated-temperature use can be performed, and the adhesive property of a laminate layer and a base material is good and carries out repeated use.

[0006]

[Means for Solving the Problem]This invention persons came to find out the following inventions, as a result of studying wholeheartedly a means to solve the above problems. Namely, a base material with which embossing of the release agent for mold attachment of this invention is not carried out to a polyolefin resin film by which embossing was carried out, It is the invention of a release agent for mold attachment sticking with ultraviolet curing nature or electron beam hardening resin (both are called radiation-curing nature resin) which polymerized by UV irradiation or electron beam irradiation. The bridge may be constructed

over a polyolefin resin film by which embossing was carried out by electron beam irradiation in this invention. A remover containing silicone resin can be mixed in a polyolefin resin film by which embossing was carried out, and a mold-release characteristic can also be controlled. As for radiation-curing nature resin here, it is preferred to contain an acryl group in resin and to have at least one kind of structure among an epoxy group, an isocyanate, or a urethane bond. [0007]A process to which a release agent for mold attachment of this invention carries out embossing of the polyolefin resin film, A process of applying radiation-curing nature resin to either [at least] a base material or a polyolefin resin film by which embossing was carried out, It can manufacture by polyolefin resin film by which embossing was carried out, process at which a base material is stuck via radiation-curing nature resin, and a process which stiffens radiation-curing nature resin by UV irradiation or electron beam irradiation.

[0008]Hereafter, this invention is explained in detail. A constituent of a polyolefin resin film used for this invention, As polypropylene, as polyethylene, a random copolymer or a block copolymer with isotactic, atactic one, those mixtures, and ethylene, etc., High density polyethylene, low density polyethylene, medium density polyethylene, straight-chain-shape low density polyethylene, Restriction in particular does not have a bridging body by electron beam irradiation of these resin, such as ultra high molecular weight polyethylene, the other Polly 3-methylpentene- 1, and polyethylene-glycol terephthalate, etc., it is independent, or these polyolefin resin can be mixed and used.

[0009]Into a polyolefin resin film used for this invention, it can add if needed, combining suitably various additive agents, such as paints, such as ultramarine, cobalt violet, and titanium oxide, and a color, an antioxidant, a fluorescent brightener, a spray for preventing static electricity, a dispersing agent, stabilizer, and a mold release grant agent.

[0010]As for quantity of an electron beam with which it irradiates, when using an electron beam for bridge construction of a polyolefin resin film, especially a polyethylene film, it is desirable to adjust in about 0.5-50 Mrad in an absorbed dose to a polyethylene film. Radiation effects sufficient in less than 0.5 Mrad are not acquired, and even if it increases the amount of electron beam irradiation exceeding 50Mrad, a level of bridge construction of a polyethylene film and heat resistance hardly change. When scouring in a polyethylene resin film or making exfoliation resin etc. of electron beam hardenability which carried out the coat on a lamination react, an exposure of the number Mrad is enough.

[0011]typical among radiation-curing nature resin used in this invention, if it mentions, (1) Polyester acrylates, polyester methacrylate. For example, ARONIKKUSU M-5300, ARONIKKUSU M-5400, ARONIKKUSU M-5500, ARONIKKUSU M-5600, ARONIKKUSU M-5700, ARONIKKUSU M-6100, ARONIKKUSU M-6200, and ARONIKKUSU M-6300, ARONIKKUSU M-6500, ARONIKKUSU M-7100, ARONIKKUSU M-8030, ARONIKKUSU M-8060, ARONIKKUSU M-8100 (above) The Toagosei Chemical industry trade name, the screw

coat 700, the screw coat 3700 (above, OSAKA ORGANIC CHEMICAL INDUSTRY, LTD. trade name), Kaya Rudd HX-220, Kaya Rudd HX-620 (above, Nippon Kayaku Co., Ltd. trade name), etc. are mentioned.

[0012](2) urethane acrylate and urethane methacrylate -- for example, ARONIKKUSU M-1100, ARONIKKUSU M-1200, ARONIKKUSU M-1210, ARONIKKUSU M-1250, ARONIKKUSU M-1260, ARONIKKUSU M-1300, ARONIKKUSU M-1310 (above) The Toagosei Chemical industry trade name, the screw coat 812, the screw coat 823, the screw coat 823 (above) OSAKA ORGANIC CHEMICAL INDUSTRY, LTD. trade name, NK ester, and U-108-A, NK ester, U-4HA (above, Aranaka Village Chemicals trade name), and DIKKU beam QA100, DIKKU beam QA300 (the Dainippon Ink & Chemicals, Inc. trade name and an isocyanate compound are included above), etc. are mentioned.

[0013](3) monofunctional acrylate, monofunctional methacrylate, vinyl pyrrolidone, an acryloyl compound, and an acrylamide compound -- for example, Methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethylhexyl acrylate, 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, 2-hydroxypropyl acrylate, tetrahydrofurfuryl acrylate, Phenoxy ethyl acrylate, cyclohexyl acrylate, cyclohexyl methacrylate, Acryloyl morpholine, benzyl acrylate, glycidyl methacrylate, N and N-dimethylamino ethyl acrylate, N, and N-dimethylaminoethyl methacrylate, N, and N-diethylamino ethyl methacrylate, butoxy ethyl acrylate, vinyl pyrrolidone, an acrylamide ether compound, etc. Ethylene oxide denaturation phenoxy-ized phosphoric acid acrylate ethylene oxide denaturation butoxy-ized phosphoric acid acrylate, In addition, the Toagosei chemical industry. Co., Ltd. -- if it says with a trade name, ARONIKKUSU M-101, ARONIKKUSU M-102, ARONIKKUSU M-111, ARONIKKUSU M-113, ARONIKKUSU M-114, ARONIKKUSU M-117, ARONIKKUSU M-152, ARONIKKUSU M-154, etc. will be mentioned.

[0014](4) Epoxy acrylate, the epoxy methacrylate 540, for example, a screw coat, the screw coat 600 (above) The OSAKA ORGANIC CHEMICAL INDUSTRY, LTD. trade name, NK ester EA800, NK ester EPA800 (above, Aranaka Village Chemicals trade name), Photomer 3016, Photomer 3082 (above, Sannopuko trade name), etc. are mentioned.

[0015](5) Polyfunctional acrylate and polyfunctional methacrylate, for example, 1,6-hexanediol diacrylate, 1, 6-hexanedioldimethacrylate, neopentyl glycol diacrylate, Diethylene glycol diacrylate, polyethylene-glycol diacrylate, Polyethylene glycol dimethacrylate, polypropylene-glycol diacrylate, Polypropylene-glycol dimethacrylate, pentaerythritol diacrylate, Dipentaerythritol hexaacrylate, isocyanuric acid diacrylate, and, [pentaerythritol doria] [isocyanuric acid doria] Trimethylolpropane triacrylate, trimethylolpropanetrimethacrylate, Ethylene oxide denaturation pentaerythritol tetraacrylate, propylene oxide denaturation pentaerythritol tetraacrylate, Acrylate ester of propylene oxide denaturation dipentaerythritol polyacrylate, ethylene oxide denaturation dipentaerythritol polyacrylate, and pentaerythritol acrylic acid adducts, etc. are mentioned. The Toagosei chemical industry. Co., Ltd. -- if it says

with a trade name -- ARONIKKUSU M-210, ARONIKKUSU M-215, ARONIKKUSU M-220, ARONIKKUSU M-230, ARONIKKUSU M-233, ARONIKKUSU M-240, ARONIKKUSU M-245, ARONIKKUSU M-305, and ARONIKKUSU M-309. ARONIKKUSU M-310, ARONIKKUSU M-315, ARONIKKUSU M-320, ARONIKKUSU M-325, ARONIKKUSU M-330, ARONIKKUSU M-400, ARONIKKUSU M-450, TO-458, TO-747, TO-755, THIC.TA2, etc. are mentioned.

[0016]They can be used being able to mix two or more or laminating [these are independent, or] them. Resin which is different in the polyolefin resin film [which carried out embossing], and base paper side may be applied and pasted together. Resin with low viscosity is applied to the polyolefin resin film side which carried out embossing especially, A method of applying and sticking resin with high viscosity to the base paper side, and a method of applying and sticking a compound which already contains an isocyanate in one side for a compound which has a hydroxyl group in one side are effective from points, such as an adhesive property and shape collapse prevention.

[0017]As a photoinitiator used when [of this invention] using especially an ultraviolet curing method, JI and the acetophenones like a trichloroacetophenone, benzophenone, A Michler's ketone, benzyl, benzoin, benzoin alkyl ether, There are benzyl dimethyl ketal, tetramethylthiuram monosulfide, thioxan tons, an azo compound, etc., and it is chosen from viewpoints of a type of a polymerization reaction of radiation-curing nature resin, stability, fitness with a black light, etc. The amount of photoinitiator used is usually 0.1 to 5% of range to radiation-curing nature resin. A storage stabilizer like hydroquinone may be used together by photoinitiator.

[0018]In the surface in a polyolefin resin film, to a molecular terminal or a side chain, an acrylyl group, A methacryloyl group, a vinyl group, an epoxy group, a vinyl amide group, a hydrosilyl group, Release agents which have a silanol group, a diazo group, an acetylenic group, and a functional group chosen from thiol groups, such as silicone resin (mainly poly dialkyl siloxane), fluorine-containing resin, alkyd resin, amino alkyd resin, and long chain alkyl group content resin, can be applied, and it can be established. Spreading of such a release agent or fixing does not interfere even in front of embossing or in the back. As a spreading gestalt of a remover, spreading by emulsion system, solvent system, non-solvent system, a mixed melting extrusion system, etc. is possible, and a condensed type, added type, constructed type [of a bridge], and ring-opening-polymerization type reaction etc. are possible as a hardening mechanism.

[0019]Although coverage of radiation-curing nature resin is not limited, it is within the limits of 1 - 50 g/m² preferably. When the adhesive property of polyolefin resin and a base material falls and coverage exceeds this range in less than this range, efficiency of not only not contributing to adhesive improvement but electron beam irradiation or UV irradiation may fall, and adhesive intensity may be lowered. As a method of applying radiation-curing nature resin of this

invention, A gravure roll and a transfer roll coater, a bar coating machine, A roll coater, an air knife coating machine, U comma coating machine, an AKKU coating machine, A smoothing coating machine, a micro photogravure coating machine, an air knife coating machine, A reverse roll coater, 4 or 5 roll coaters, a braid coating machine, What kind of coating machines, such as a dip coater, a bar coating machine, a rod coating machine, a kis coating machine, gate roll coater, a squeeze coating machine, a fall curtain coating machine, a slide coating machine, and a die coater, may be used.

[0020]About 100-300 kV is suitable for accelerating voltage which a scanning method, a broad beam method, a curtain beam method, an ion plasma method, etc. are adopted, and irradiates with an electron beam as an exposure method of an electron beam. Even if it uses a gamma ray, the same processing as electron beam irradiation can be performed, but generally dose density is low and it is not desirable as a manufacturing method. When using UV irradiation, a sensitizer can be blended and used a photoinitiator and if needed, but there is a limit from a point of penetrating power. As a light source in a case of using ultraviolet rays, a low pressure mercury lamp, a medium-voltage mercury-vapor lamp, a high-pressure mercury-vapor lamp, a xenon lamp, a tungsten lamp, etc. are used suitably, for example.

[0021]Since being accompanied by the danger of ozone evolution and a radical generated on the polyolefin resin film surface will react to oxygen and will serve as a peroxide on the occasion of electron beam irradiation, if an oxygen density is high, It is preferred to perform substitution by inactive gas, such as nitrogen, helium, and carbon dioxide, and to irradiate with 600 ppm or less of oxygen densities in atmosphere preferably controlled to 400 ppm or less.

[0022]In this invention, mold attachment nature after elevated-temperature repeated use is held because a polyolefin resin film which performed mold attachment **, and a base material have pasted up with radiation-curing nature resin with expanding and contracting [little] by heating and *****. That is, when mold attachment is performed after using paper for a base material and carrying out melting extrusion of the polyolefin resin, mold attachment processing will be made by paper, but mold attachment of paper eases with steps by a repetition of an elevated temperature and ordinary temperature and repetition of drying and moisture absorption of a base material. Unevenness of a polyolefin resin layer by which melting extrusion was carried out is also eased with relaxation of paper, and, usually mold collapse is produced. In a method of this invention, since embossing is not made by base material, mold collapse of a polyolefin resin layer in a form which follows in footsteps of a shape change of such a base material does not arise.

[0023]That mold attachment nature after elevated-temperature repeated use is held by a method of this invention, Since radiation-curing nature resin existed between a base material and a polyolefin resin film which performed mold attachment and it has hardened by radiation irradiation along with a mold of a polyolefin resin film, it is because unevenness of a polyolefin

resin layer is strengthened from the inside. It is thought that especially hardened radiation-curing nature resin has prevented shape collapse by heat of a polyolefin resin layer since plasticization by heat does not take place.

[0024]According to a method of this invention, since a polyolefin resin film and a base material are pasted up with radiation-curing nature resin, an adhesive trouble of the polyolefin resin film itself does not arise. That is, that [a base material's] is [an adhesive property with a base material at the time of melting extrusion] good, while, as for polypropylene, TPX, etc., resin itself has detachability at neither that, a synthetic resin film nor a metallic foil lamination in paper. For this reason, although copolymerization of the ethylene is carried out, or mixed fusion is carried out and an adhesive property is improved, since heat resistance is sacrificed for this method, it worsens repeated use nature, mold holdout, elevated-temperature usability, etc. It is not necessary to use a substance of such a low melting point, and repeated use becomes possible without mold collapse at an elevated temperature in a method of this invention.

[0025]In this invention, in order to improve a polyolefin resin layer, the adhesive property of a base material, and wettability, the polyolefin resin film surface may be performed, and surface treatments, such as corona treatment, may be carried out to a support surface, or surface treatments, such as a subcoat, may be performed. Back coat layers, such as prevention from curl, prevention from electrification, or stratum disjunctum, can be provided in a rear face of a release agent of this invention, and it can contain in a back coat layer, combining suitably a spray for preventing static electricity, a hydrophilic binder, latex, a hardening agent, paints, a surface-active agent, a binder, etc.

[0026]About mold attachment processing of a polyolefin resin film, It does not interfere, no matter what methods [, such as general matched steel embossing, steel/steel embossing, a paper / steel embossing, rubber / steel embossing, lithography steel embossing high voltage embossing, and heat embossing / mold attachment] it may use. When mold attachment processing is performed on one side of a polyolefin resin film, it does not interfere, even if the rear face is flat and mold attachment is carried out.

[0027]As a base material used for this invention, although a lamination article of coated papers and synthetic resin films, such as a machine glazed paper, glassine, paper of fine quality, art paper, coat paper, cast paper, etc. besides regular paper stencil paper, a synthetic paper, and a metallic foil and paper, etc. are used, Natural pulp paper which uses wood pulp of softwood pulp, hardwood pulp, and needle-leaf tree broad-leaved tree mixed pulp as the main ingredients is used advantageously. Although there is no restriction in particular about thickness of stencil paper, a smooth thing is preferred and the basis weight has $30\text{g}/\text{m}^2$ - preferred $300\text{ g}/\text{m}^2$.

[0028]Stencil paper which uses as the main ingredients natural pulp used advantageously can

be made to contain various high molecular compounds and an additive agent in a method of this invention. for example, starch and the derivative of starch (cation-ized starch and phosphorylation starch.) Polyacrylamide and polyvinyl alcohol, such as an oxidized starch, a polyvinyl alcohol derivative (it and) [perfect-] Partial saponification, carboxy denaturation, cation denaturation, other various denaturation polyvinyl alcohol, Dry paper reinforcing agents, such as gelatin (alkali treatment, acid treatment, various derivatized gelatin), Naturally-occurring-polymers polysaccharide, such as star gum and an alginic acid derivative, higher-fatty-acid metal salt, A rosin derivative, dialkyl ketone, alkenyl, or an alkyl succinic acid anhydride, Sizing compounds, such as epoxidation higher fatty acid amide, an organic fluoro compound, and a dialkyl ketene dimer emulsified matter, A polyamide polyamine epichlorohydrin resin, melamine resin, urea resin, Humid paper reinforcing agents, such as epoxidation polyamide resin, stabilizer, paints, a color, an antioxidant, a fluorescent brightener, various latex, and an inorganic electrolyte (sodium chloride.) Loading materials, such as fixing agents, such as pH adjusters, such as sodium sulfate, sodium phosphate, a calcium chloride, a lithium chloride, a magnesium chloride, magnesium sulfate, and barium chloride, a sulfuric acid band, and chloridation aluminum, calcium carbonate, kaolin, talc, and clay, You can make it contain combining additive agents, such as an organic conducting agent, suitably. It may be made to distribute in pulp slurry in a paper-making stage, and may be made to add in paper-making Tab size, and these inclusions may apply a solution by various coating machines.

[0029]

[Function]In the release agent for mold attachment of this invention, since the phenomenon of relaxation of unevenness of a base material does not start, mold collapse of the polyolefin resin film layer in the form which follows in footsteps of the shape change of a base material does not arise, but repeated use can be carried out at an elevated temperature. Since it has hardened by radiation irradiation in the form where the radiation-curing nature resin which is not transformed with heat met unevenness of the polyolefin resin film, unevenness of the polyolefin resin layer was strengthened from the inside, and the shape collapse by heat has been prevented. Since the release agent for mold attachment of this invention does not have to carry out copolymerization of the ethylene for an adhesive improvement of the polyolefin resin film of detachability or does not have to carry out mixed fusion, repeated use of it can be carried out without mold collapse at an elevated temperature.

[0030]

[Example]Hereafter, although working example explains this invention in detail, the contents of this invention are not restricted to working example.

[0031]As a base material for working example 1 release agents, commercial process paper stencil paper (Mitsubishi Paper Mills make and process paper stencil paper 125g/m²) was used. Heat embossing is performed to a 30-micrometer-thick polypropylene resin film with a

metal / paper embossing roll, subsequently -- performing corona discharge treatment -- a rear face -- a radiation-curing nature resin composition (the product made from the Toagosei chemical industry.) Apply urethane acrylate, ARONIKKUSU M1210, monofunctional acrylate, and 7:3 mixtures of ARONIKKUSU M113 by 20 g/m², make it stick with process paper stencil paper, and with the accelerating voltage of 250kv. Electron beam irradiation (an electron curtain, the product made by ESI) was performed so that an absorbed dose might serve as 3Mrad, and the release agent for mold attachment was obtained.

[0032]As a base material for working example 2 release materials, the PET film (125 micrometers in thickness, product made from diamond foil) which performed corona treatment was used. After performing heat embossing with same metal / the paper embossing roll as working example 1, the high-density-polyethylene resin film which constructed the bridge by the electron beam irradiation of 20Mrad was used as a polyolefin resin film. It was made to stick using resin (Dainippon Ink & Chemicals make and DIKKU beam QA300) 10 g/m² which contains an isocyanate by using both as radiation-curing nature resin, electron beam irradiation was performed so that an absorbed dose might serve as 3Mrad with the accelerating voltage of 250kv, and the release agent for mold attachment was obtained.

[0033]As a base material for working example 3 release agents, the same process paper stencil paper as working example 1 was used. Heat embossing is performed to a 30-micrometer-thick biaxial extension polypropylene resin film with same metal / the paper embossing roll as working example 1, subsequently -- performing corona discharge treatment -- a rear face -- a radiation-curing nature resin composition (the product made from the Toagosei chemical industry.) Urethane acrylate UV3400, the product made from the Aranaka village chemicals, 50:50 mixtures of epoxy acrylate NK ester EA800, as a photoinitiator -- 2% of the weight of Ciba-Geigy IRGACURE 651 -- containing -- applied by 20 g/m², and it was made to stick with process paper stencil paper, hardened using high-pressure-mercury-lamp 2 light of 120 w/cm, and the release agent was obtained.

[0034]As stencil paper for comparative example 1 release agents, the process paper stencil paper of the same marketing as working example 1 was used. After performing corona treatment on the surface, it laminated by carrying out melting extrusion of the polypropylene resin by a thickness of 30 micrometers. Heat embossing was performed with same metal / the paper embossing roll as working example 1, and the release agent for mold attachment was obtained.

[0035]Corona treatment was performed to the surface and it laminated by carrying out melting extrusion of the polypropylene resin containing a part for 10% of the weight of ethylene by a thickness of 30 micrometers as stencil paper for comparative example 2 release agents using the same polyethylene-terephthalate-resin film as working example 2. Heat embossing was

performed with same metal / the paper embossing roll as working example 1, and the release agent for mold attachment was obtained.

[0036]The examination shown below about the release agent obtained above by working example 1-3 and the comparative examples 1-2 was done. The result is shown in Table 1.

[0037][Mold preservability] In each sample, 2 cm around of the same handle portion was analyzed with the three-dimensional granularity measuring instrument on condition of the 500-point sampling in the direction of X, and the direction of Y 500 line sampling, and ten-point average-of-roughness-height SRz, maximum height SRma, and the maximum mountain height SRp were found. next, each sample -- the urethane paste for synthetic leather (trade name Chris Bon -- 6116 SL) the Dainippon Ink & Chemicals make and 30% of methyl ethyl ketone -- as a solvent -- containing -- paste coating was again performed after desiccation at spreading and 135 **, it piled up with the urethane resin impregnating base fabric, heat desiccation was carried out at 135 **, it separated from the release agent, and synthetic leather was obtained. Using the used release agent, the same synthetic leather was created 10 times and it was considered as the release agent after use. In the release agent after each use, the same handle portion as having measured before use was similarly analyzed with the three-dimensional granularity measuring instrument, and ten-point average-of-roughness-height SRz, maximum height SRma, and the maximum mountain height SRp were found, and it expressed with the ratio (%) to the parameter of the three-dimensional surface roughness of the release agent before corresponding use. As mold preservability, it expressed with the average value of the ratio of these three parameters. Mold preservability is so good that this figure is high.

[0038][Adhesive property] After repeating synthetic leather 3 times and creating with each sample, the mold attachment portion (polyolefin resin layer) and the substrate were exfoliated, and the adhesive property was confirmed. The adhesive property made the good thing A, so that the polyolefin resin film layer or the substrate broke, and what a polyolefin resin film layer and a substrate separate was made into **.

[0039]

[Table 1]

	型保存性 (%)	接着性
実施例 1	93	優
実施例 2	93	優
実施例 3	94	優
比較例 1	72	劣
比較例 2	68	劣

[0040]Evaluation .. Since the release agent created in working example used radiation-curing nature resin for the base material and has pasted up the polyolefin resin film which carried out embossing beforehand on it, Mold collapse of the polyolefin resin film layer in the form which follows in footsteps of the shape change of a base material does not arise, but unevenness of embossing is strengthened from the inside and the repeated use of it can be carried out at an elevated temperature many times. The adhesive strength of a base material and a polyolefin resin film is also high, and its repeated use nature is good.

[0041]

[Effect of the Invention]The release agent for mold attachment of this invention is [like / it is ***** and] excellent in mold attachment nature, the mold preservability in elevated-temperature use, and repeatability also from the above-mentioned evaluation.

The practical value is large.

[Translation done.]